[Continued on next page]

(54) Title: A METHOD OF IMPLEMENTING FIXED-WIDTH DATA TYPES
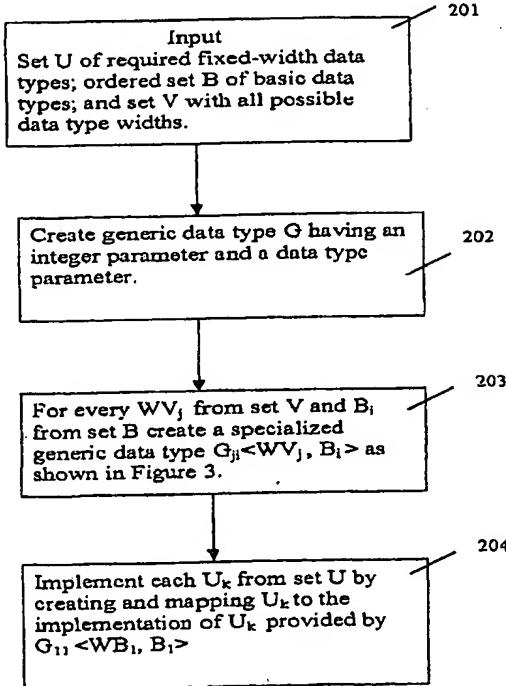
(57) Abstract: A method of implementing fixed-width data types which are not directly supported by a programming language, in a portable manner. A set U of required fixed-width data types, an ordered set B of basic data types and a set V with all possible data type widths are provided as inputs (201). A generic data type G having an integer parameter and a data type parameter is created (202). For every data type width WVj from set V and basic data type Bi from set B a specialized data type G is created (203). Then, each required data type Uk from set U of required data types is implemented by creating and mapping required data type Uk to the implementation of Uk provided by the generic data type G11 having the parameters data type width WB1 and basic data type B1 (204).

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                    ┌──────────────────────────────┐
                    │           Input               │  201
                    │ Set U of required fixed-width  │
                    │ data types; ordered set B of   │
                    │ basic data types; and set V    │
                    │ with all possible data type    │
                    │ widths.                        │
                    └──────────────┬───────────────┘
                                   │
                                   ▼
                    ┌──────────────────────────────┐
                    │ Create generic data type G     │  202
                    │ having an integer parameter     │
                    │ and a data type parameter.      │
                    └──────────────┬───────────────┘
                                   │
                                   ▼
                    ┌──────────────────────────────┐
                    │ For every WVj from set V and Bi │  203
                    │ from set B create a specialized │
                    │ generic data type Gji<WVj, Bi> │
                    │ as shown in Figure 3.           │
                    └──────────────┬───────────────┘
                                   │
                                   ▼
                    ┌──────────────────────────────┐
                    │ Implement each Uk from set U by │  204
                    │ creating and mapping Uk to the  │
                    │ implementation of Uk provided   │
                    │ by G11 <WB1, B1>                │
                    └──────────────────────────────┘
```

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